

## **ABSTRACT**

Systems and methods are provided the autocentering, autofocusing, acquiring,  
5 decoding, aligning, analyzing and exchanging among various parties, images, where  
the images are of arrays of signals associated with ligand-receptor interactions, and  
more particularly, ligand-receptor interactions where a multitude of receptors are  
associated with microparticles or microbeads. The beads are encoded to indicate the  
identity of the receptor attached, and therefore, an assay image and a decoding image  
10 are aligned to effect the decoding. The images or data extracted from such images  
can be exchanged between de-centralized assay locations and a centralized location  
where the data are analyzed to indicate assay results. Access to data can be restricted  
to authorized parties in possession of certain coding information, so as to preserve  
confidentiality.

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